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ELIMINATION OF INSECT FRAGMENTS FROM TEA

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ELIMINATION OF INSECT FRAGMENTS FROM TEA

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The Food and Drug Administration of U.S.A are making a regular survey for extraneous matter in tea by taking samples of tea from super market shelf of New York, Boston, New Orleans and San Francisco. They have isolated fragments of insects such as aphids, thrips, moths, weevils, field insects and also different types of whole insects like scale insects, aphids, moths, larvae, flies and mites.

Tocklai is working on the elimination of extraneous matter from tea since last few years. Since purity of processed tea in the competitive market is of utmost importance, every possible step should be taken to prevent the foreign matters from finding entry in tea, lest the export of Indian tea may be damaged.

Our Advisory Bulletin No. 8 was published in 1976 for removal of iron particles from tea. This bulletin provides information on the possible sources of insect contamination and lists the preventive measures which might be a guide and help the planters to keep their teas free from insect fragments.

SOURCES OF CONTAMINATION

Insect contamination is likely to take place from the following sources.

A. In Field :

1. Leaf-rollers and leaf-tiers (caterpillar pests of tea) which remain enclosed inside folded shoots and leaves, might be processed with tea leaves and fragments carried over to made tea.
2. Aphids, thrips and scale insects may find their way in made tea when badly infested shoots are manufactured.
3. Mites on infested leaves are plucked with them and after manufacture may be carried over to made tea.

B. Withering :

After field, the highest contamination of tea with insects occurs during withering. Photophile insects which are attracted by the lights fitted in the withering area, settle down or get trapped in the warm beds of green leaves and eventually find their way in made tea.

1. Chung or racks : In *chung* or racks, withering is carried out on hessian cloth supported by wire or bamboo. Bamboos are often infested with borers and the faecal matter gets easily mixed up with tea shoots. This is in addition to large number

of insects which are attracted to fluorescent or ordinary lights fitted all around the *chung*.

Open troughs : Large number of moths, beetles, bugs or wasps, grass-hoppers of various sizes, mole crickets and other smaller crickets are attracted by fluorescent lights fitted to the roof of the troughs. They enter the troughs freely as there is no barrier of wire netting etc.

Closed troughs : In closed troughs insects attracted by lights settle around the fluorescent light fixed on the roof or side wall. With the population build up outside, the insect ingress occurs through the small openings meant for spreading the leaf.

Processing :

1. Fermentation room : Chances of contamination in the fermenting room are very little as the floor and *gamlas* are cleaned and washed with water and detergents at regular intervals.

2. Sorting room : Large number of insects are attracted to the fluorescent lights fitted in the room. The moths, grass-hoppers, bugs, flies and jassids fly around the tube lights during night. Some of them eventually settle down or even drop dead on the bulk tea kept on the floor. Before dawn, balance of this insect population rests on walls, posts, roof and in the dark places at corners and may creep in the heaps of made tea during the day. A large number of them die inside the sorting room and contaminate the tea.

3. Packaging material : Packaging materials such as tea chest panels and battens are often very badly damaged by different kinds of borers (beetles) during storage in the garden factory or during transportation of the material from the plywood factory. The infested packing material may cause contamination of made tea.

PREVENTIVE MEASURES

By taking simple precautions during plucking, withering, manufacturing, storage and shipment, insect contamination could be avoided to a very large extent, if not completely eliminated.

During plucking :

1. Effective control measures should be taken for keeping the field population of mites/insects under control by minimal use of agricultural chemicals.
2. The leaves badly infested with red spider and scarlet mite and shoots infested with flushworm, aphids and thrips (in case of severe attack) should be discarded.
3. Scale insect infested plucking shoots are common in Darjeeling : badly infested shoots should be discarded.

Withering house :

Fluorescent lights in *chungs*, open or closed troughs should be avoided. Strong light sources *viz.* tube lights/flood lights should be fitted at a distance of 6-8 metres (20-25 feet) outside the withering trough to attract the insect swarms away from the troughs. Low power bulbs might be fitted inside the troughs. To capture the insects which might be attracted to these lights, light traps (Fig. 1a & b) should be fitted under them.

Inside the factory :

1. The windows and other open ventilators should be fitted with wire mesh to prevent the entry of insects. But this may cause stuffiness, for which exhaust fans may be provided in the sorting room.
2. The overhead tube lights should be fitted with light traps as mentioned earlier so that should, per chance, any insect enter through the openings of the roof or any other unguarded passage, it can be trapped.
3. The workers of the factory should be educated regarding the contamination of made tea by insect fragments. It is worthwhile to engage a few labourers, particularly during May to October, for hand collection of insects from the bulk tea as well as from the floor.
4. The sweepings from the floor of the sorting room should be disposed off carefully to avoid dead insects.
5. As a precautionary measure, before storing of the packaging materials, the godown should be thoroughly cleaned paying particular attention to the cracks and crevices on the walls and floors. The floor and the walls including the battens should be thoroughly sprayed with Endosulfan 35 EC at 1 in 400 parts of water with a high volume sprayer at least 2-3 weeks before storage. Cracks and crevices should be thoroughly cemented.

Affected materials should not be kept in the godown without heat treatment. Infested panels and battens should always be subjected to heat treatment at 90--120°C in a tea drier for 10--15 minutes or may be placed inside the drier for an hour or two at the end of day's firing. The panels should be spread out inside the drier instead of stacking, otherwise the drier exhaust would be blanked off.

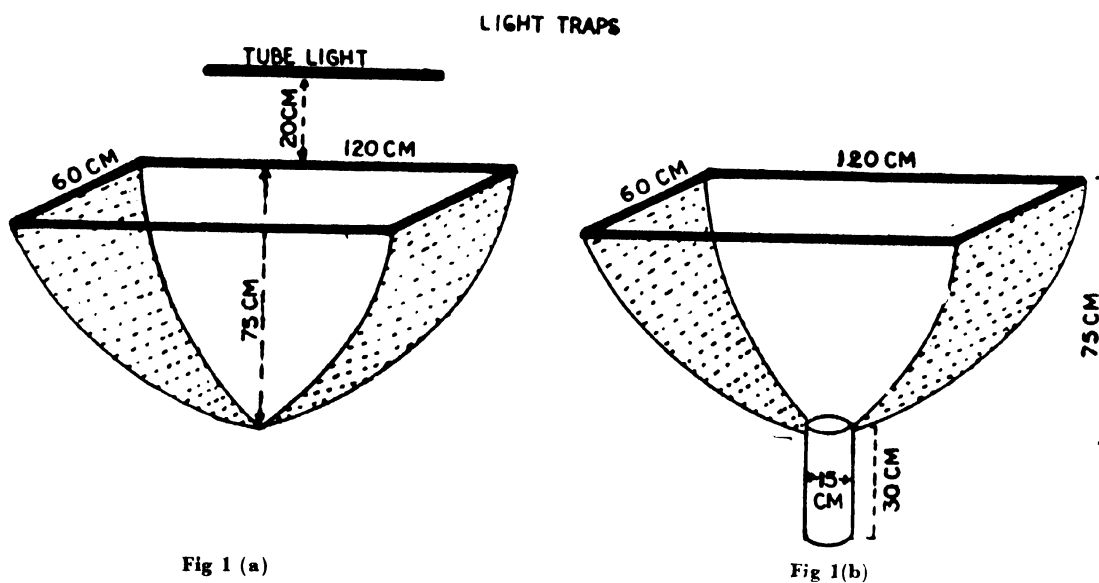
The treated panels should always be kept separate from the untreated ones.

During shipment :

Cases have come to light where borers and booklice were found to infest tea during long shipment. It may be recalled that according to an estimate tea travels an average of 1300 km from tea garden before reaching the final consumer within India. Distances travelled are several times greater for exported teas.

Conclusion

If adequate precautionary measures are taken as outlined above, insect contamination of made tea could be largely avoided, if not completely eliminated.



Description of light trap :

Simple light-traps can be made with four bamboo strips and about two metres of polythene sheet.

A rectangular frame (60 cm \times 120 cm) is made with the bamboo strips. Polythene sheets are cut into pieces and either stitched or sealed by heat to make a bowl-shaped structure (120 cm \times 60 cm \times 75 cm). This polythene structure is stitched to the bamboo-frame and the inner walls are smeared with about 200 gms of grease.

The whole structure is placed 15-20 cm below an electric light.

For a better result, an additional collector (30 cm \times 15 cm) can be attached at the bottom of the polythene-bowl. The inner wall of the collector should also be smeared with grease.

Insects attracted to light will drop into the sticky grease and they will be immobilized.

Trapped insects should be collected and fresh layers of grease should be put from time to time.

